

## FIRE FIGHTING EQUIPMENT

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Inventor:

Applicant: SECR DEFENCE

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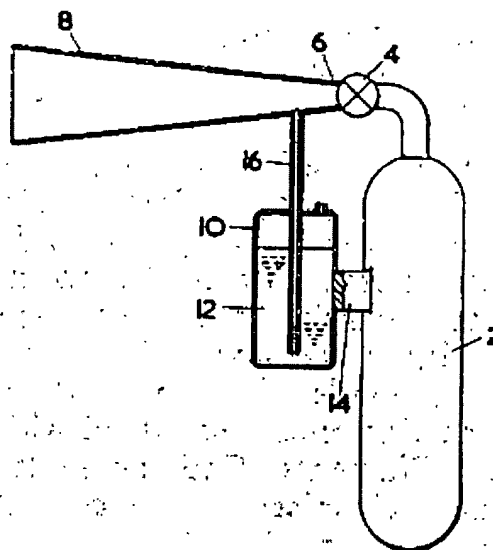
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### Abstract of GB1306734

1306734 Fire fighting with CO<sub>2</sub> DEFENCE  
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 [15 July 1970] 34242/70 Heading A5A A  
 method of fire fighting wherein the electrostatic charge produced on release of the suppressant is reduced comprises releasing a finely divided mixture of a solidified inert gas and a liquid which has electrical resistivity not greater than 1000 ohm cm and freezes between 200 and 250 K. The inert gas may be CO<sub>2</sub>, and the liquid may be water containing methanol ethylene glycol, and/or NaCl or CaCl<sub>2</sub>, in an amount less than 10% by wt. Apparatus may comprise CO<sub>2</sub> cylinder 2 connected via valve 4 to horn 8, and reservoir 10 of water + anti-freeze 12 releasably fastened at 14 to 2 and connected to horn 8 via pipe 16. When valve 4 is opened the CO<sub>2</sub> draws liquid from 10 and the mixture discharges as finely divided liquid particles entrained in solidified CO<sub>2</sub>.



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## DRAWINGS ATTACHED

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(19)



## (54) IMPROVEMENTS IN OR RELATING TO FIRE FIGHTING EQUIPMENT

(71) I, THE SECRETARY OF STATE FOR DEFENCE (formerly Minister of Aviation Supply), do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to fire fighting equipment in which a quantity of inert gas is released.

It is well known to fight a fire by releasing a quantity of inert gas in the vicinity of the fire, and a gas frequently used for this purpose is carbon dioxide. However, the solidified carbon dioxide gas released by known fire fighting equipment carries an electrostatic charge so that if the equipment is portable, the person carrying it may become charged. Alternatively an insulated object in the vicinity of the released solid may act as a capacitor and become charged. If charge build-up is such that the charged object subsequently discharges, and a flammable gas or vapour is present, the gas or vapour may be ignited.

According to the invention a method of reducing the electric charge produced during the release of a quantity of solidified inert gas for the purpose of fire fighting comprises releasing a finely divided mixture of the solidified inert gas and a liquid having electrical resistivity not greater than about 1000 ohm centimetre, and which freezes at a temperature between 200°K and 250°K.

Preferably the liquid is water to which has been added an anti-freeze substance so that the liquid changes to a solid at a temperature in the range of about 200°K to 250°K. The anti-freeze substance may be based on methanol or a mixture of methanol and ethylene glycol and may include one or more inorganic salts such as sodium chloride or calcium chloride.

It is advantageous to add an inorganic salt since the addition of methanol or ethylene glycol lowers the electrical conductivity of the liquid; the addition of the inorganic salt tends to increase the electrical conductivity of the liquid. Preferably the

concentration of the salt is less than 10% by weight so that settling-out at low temperatures does not occur.

The method according to the invention may be carried out using apparatus which comprises a gas reservoir, means for controllably releasing and directing the flow of solidified gas therefrom and means for entraining in the released gas liquid from a separate source. The liquid may be containable in a reservoir in communication with the atmosphere and a pipe may be provided to connect the reservoir to a jet arranged in the means for directing the flow of solidified gas so that when gas is released through said means, liquid can thereby be drawn from the reservoir and through the jet so as to be entrained in the released solidified gas.

The gas reservoir may be a cylinder of carbon dioxide, the means for directing the gas may be a horn connected to the cylinder and the liquid reservoir may be a bottle attached releasably to the cylinder.

One embodiment of the apparatus according to the invention will now be described by way of example only and with reference to the drawing accompanying the provisional specification in which a carbon dioxide cylinder 2 is connected through control valve 4 to the end 6 of a horn 8. Reservoir 10 containing water 12, to which a suitable proportion of anti-freeze substance has been added, is fixed by releasable fastening 14 to cylinder 2, and is connected to horn 8 through pipe 16. In operation valve 4 is opened to allow carbon dioxide from cylinder 2 to pass through horn 8 and water 12 is drawn from reservoir 10 through pipe 16 into horn 8 where it mixes with the carbon dioxide gas and is discharged therewith in finely divided form entrained in the carbon dioxide which solidifies as it is released.

While the method according to the invention may be used with either portable or fixed inert-gas fire extinguishers, it is particularly suitable for use on a large scale e.g. in warehouses, or in ships such as tankers

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where there is a high risk of the presence of inflammable gas.

WHAT I CLAIM IS:—

1. A method of reducing the electric charge produced during the release of a quantity of solidified inert gas for the purpose of fire fighting which comprises releasing a finely divided mixture of the solidified inert gas and a liquid having electrical resistivity not greater than about 1000 ohm cm. and which freezes at a temperature between 200°K and 250°K.
2. A method according to claim 1 in which the inert gas is carbon dioxide.
3. A method according to claim 1 or claim 2 in which the liquid is water to which has been added an anti-freeze substance so that the water freezes at a temperature between 200°K and 250°K.
4. A method according to claim 3 in which the anti-freeze substance is methanol.
5. A method according to claim 3 in which the anti-freeze substance is a mixture of methanol and ethylene glycol.
6. A method according to any one of claims 3, 4 or 5 in which the anti-freeze substance includes one or more inorganic salts.
7. Apparatus when used for carrying out

a method according to any preceding claim comprising a gas reservoir, a liquid reservoir, means for controllably releasing and directing the flow of solidified gas therefrom and means for entraining in the released gas liquid from said liquid reservoir.

8. Apparatus according to claim 7 in which liquid in the liquid reservoir is in communication with the atmosphere and a pipe is arranged so as to conduct liquid in the reservoir to a jet in the means for directing the flow of solidified gas so that when solidified gas is released through said means, liquid can be drawn from the reservoir through the jet so as to be entrained in the released solidified gas.

9. Apparatus according to claim 8 in which the gas reservoir is a cylinder of carbon dioxide, the means for directing the flow of solidified gas is a horn connected to the cylinder, and the liquid reservoir is a bottle attached releasably to the cylinder.

10. Apparatus substantially as hereinbefore described with reference to the drawing accompanying the provisional specification.

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Agent for the Applicant.

